CLAIMS

1. A stator for a dynamoelectric machine, comprising:

a stator core having a generally cylindrical shape, the stator core having a plurality of circumferentially spaced slots,

a stator winding including a plurality of conductors, each conductor having a plurality of straight segments interconnecting a plurality of end loop segments;

the plurality of conductors organized into at least a first filar and a second filar, corresponding conductors of the first and second filars being electrically connected in parallel;

the plurality of conductors organized into multiple phases defined by a circumferential pitch, each phase having a conductor in the first filar and a conductor in the second filar;

the plurality of conductors organized into layers, each layer representing a set of equidistant radial positions in the slots filled by the straight segments of the conductors;

the end loop segments of the first and second filars being circumferentially aligned and axially opposite each other;

the straight segments of corresponding conductors of the first and second filars residing in common slots in the stator core; and

the straight segments of one phase being positioned in the same layer as adjacent straight segments in the adjacent phase.

2. The stator of claim 1, wherein the plurality of conductors are structured to define air flow paths between the plurality of conductors.

3. The stator of claim 2, wherein the airflow paths extend between the layers of the stator winding.

4. The stator of claim 1, wherein the plurality of conductors are arranged in a cascading structure defined by a plurality of consecutive straight segments of one conductor residing in a common layer.

5. The stator of claim 4, wherein each end loop segment and one straight segment connected to the end loop segment define a first radial extension and a second radial extension, the first and second radial extensions being in opposite directions.

6. The stator of claim 5, wherein the first radial extensions of the first filar are in a direction opposite the first radial extensions of the second filar.

7. The stator of claim 1, wherein the plurality of conductors are arranged in an interlaced structure defined by a plurality of consecutive straight segments of one conductor residing in alternating layers.

8. The stator of claim 7, wherein one of each end loop segment and one straight segment connected to the end loop segment define a radial extension.

9. The stator of claim 1, wherein the plurality of conductors each have a rectangular cross-sectional shape, and wherein the largest dimension between the width and depth is less than 2 mm.

10. The stator of claim 1, wherein the straight segments of corresponding conductors of the first and second filars reside in adjacent layers in the slots.

11. The stator of claim 1, wherein the each phase has a single continuous conductor forming the first filar and a single conductor forming the second filar.

12. The stator of claim 1, wherein the number of layers is greater than six.

13. The stator of claim 1, wherein the number of turns in each phase is equal to the number of layers divided by the number of filars.

14. The stator of claim 1, wherein the conductors are aligned in one radial row in each slot.

15. The stator of claim 14, wherein the width of the conductor fits closely to the width of the slot, including any insulation.

16. A stator for a dynamoelectric machine, comprising:

a stator core having a generally cylindrical shape, the stator core having a plurality of circumferentially spaced core slots;

a stator winding including a plurality of conductors extending through the core slots, each conductor having a plurality of straight segments interconnecting a plurality of end loop segments;

the plurality of conductors organized into multiple phases, each phase having multiple filars, each filar of each phase being electrically connected in parallel to corresponding filars in each phase;

the plurality of conductors organized into layers, each layer representing a set of equidistant radial positions in the slots filled by the straight segments of the conductors; the plurality of conductors being arranged in a cascading structure defined by a plurality of consecutive straight segments of one conductor residing in a common layer; and

each phase having conductors with straight segments residing in a common layer with straight segments of conductors of the other phases.

17. The stator of claim 16, wherein the plurality of conductors each have a rectangular cross-sectional shape, and wherein the greatest dimension of the width and depth is less than 2 mm.

18. The stator of claim 16, wherein the number of layers is greater than or equal to six and each phase has a single continuous conductor forming the first filar and a single conductor forming the second filar.

19. The stator of claim 16, wherein each conductor extends circumferentially around the stator core for at least two turns.

20. The stator of claim 16, wherein each end loop segment and one straight segment connected to the end loop segment define a first radial extension and a second radial extension, the first and second radial extensions being in opposite directions.

21. The stator of claim 20, wherein the first radial extensions of the filars corresponding to a first phase are in a direction opposite the first radial extensions of the filars corresponding to a second phase.

22. The stator of claim 16, wherein, the straight segments of each filar of each phase reside in common slots in the stator core.

23. The stator of claim 16, wherein the end loop segments of the first and second filars are circumferentially aligned and axially opposite each other.

24. The stator of claim 16, wherein the number of turns is equal to the number of layers divided by the number of filars.

25. The stator of claim 16, wherein the plurality of conductors are aligned in one radial row in each slot.

26. The stator of claim 16, wherein the plurality of conductors are structured to define air flow paths between the layers of conductors.

27. The stator of claim 16, further including a plurality of insulators located in the core slots having a thickness less than .0045 inches.

28. The stator of claim 16, wherein portions of the end loop segments extend beyond the radial position of the straight segments located in an outermost layer.

29. The stator of claim 28, wherein the portions of the end loop segments extend beyond the radial position of the straight segments located in the outermost layer by approximately one radial width of the conductor.

30. The stator of claim 16, wherein a plurality of consecutive straight segments of one conductor, reside in a common layer for substantially one revolution around the stator core.